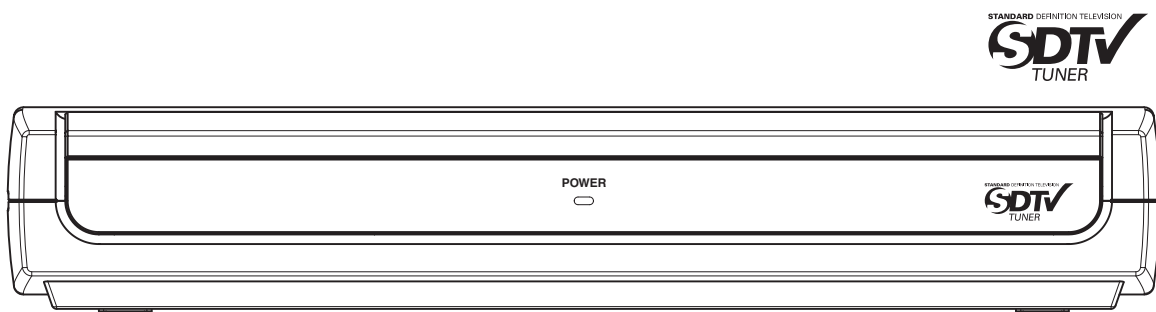


PHILCO

SERVICE MANUAL

DTV DIGITAL TO ANALOG CONVERTER (SET TOP BOX)

TB100HH9



IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Funai Equipment. The service procedures recommended by Funai and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Funai could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Funai has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Funai must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

TABLE OF CONTENTS

Specifications	1-1-1
Important Safety Precautions	1-2-1
Standard Notes for Servicing	1-3-1
Cabinet Disassembly Instructions	1-4-1
Block Diagrams	1-5-1
Schematic Diagrams / CBA's and Test Points	1-6-1
Waveforms	1-7-1
Wiring Diagram	1-8-1
Lead Identifications	1-9-1
Exploded Views	1-10-1
Mechanical Parts List	1-11-1
Electrical Parts List	1-12-1

SPECIFICATIONS


[ATSC]

Description	Unit	Nominal
1. CH COVERAGE		
VHF	ch	2 to 13
UHF	ch	14 to 69
2. VIDEO OUTPUT VOLTAGE		
CVBS	Vp-p	1.0
3. AUDIO OUTPUT VOLTAGE		
L-OUT	mVrms	2000
R-OUT	mVrms	2000
4. AUDIO DISTORTION		
L-OUT	%	0.01
R-OUT	%	0.01
5. AUDIO S/N		
L-OUT	dB	85
R-OUT	dB	85
6. AUDIO SEPARATION		
L-OUT	dB	85
R-OUT	dB	85
7. AUDIO FREQ. RESPONSE [20-20kHz]	dB	0

Note: Nominal specs represent the design specs. All units should be able to approximate these – some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; In no case should a unit fail to meet limit specs.


IMPORTANT SAFETY PRECAUTIONS

Product Safety Notice

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a  on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are carefully inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

- I. Also check areas surrounding repaired locations.
- J. Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.
- K. When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

Precautions during Servicing

- A. Parts identified by the  symbol are critical for safety. Replace only with part number specified.
- B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.
- C. Use specified internal wiring. Note especially:
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
- D. Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation tape
 - 2) PVC tubing
 - 3) Spacers
 - 4) Insulators for transistors
- E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.
- F. Observe that the wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).
- G. Check that replaced wires do not contact sharp edges or pointed parts.
- H. When a power cord has been replaced, check that 5 - 6 kg of force in any direction will not loosen it.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts, and wires have been returned to their original positions. Afterwards, do the following tests and confirm the specified values to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1: Ratings for selected area

AC Line Voltage	Clearance Distance (d), (d')
120 V	≥ 3.2 mm (0.126 inches)

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

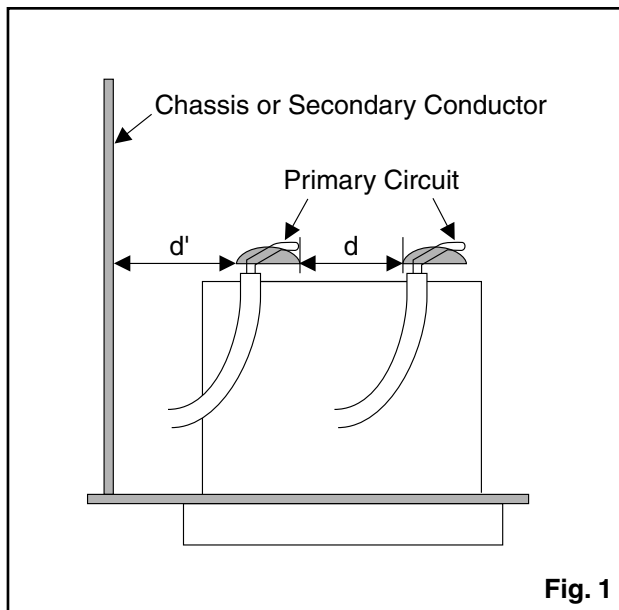


Fig. 1

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

Measuring Method (Power ON):

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across the terminals of load Z . See Fig. 2 and the following table.

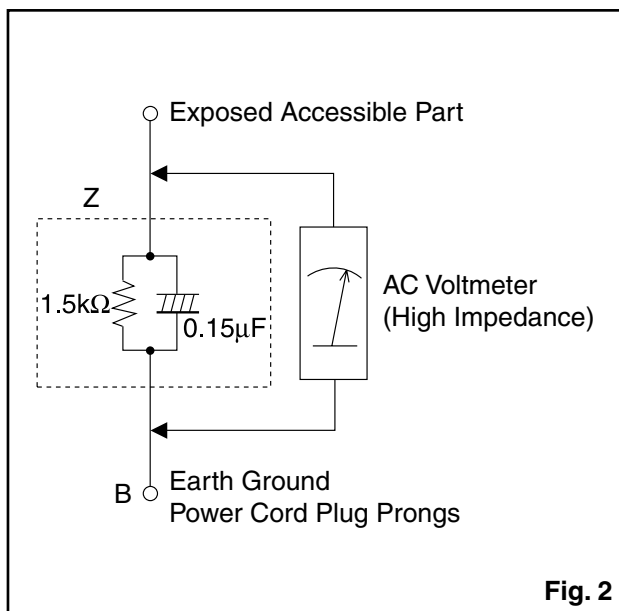


Fig. 2

Table 2: Leakage current ratings for selected areas

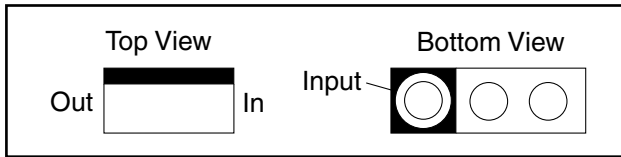
AC Line Voltage	Load Z	Leakage Current (i)	Earth Ground (B) to:
120 V	0.15 μ F CAP. & 1.5 kΩ RES. Connected in parallel	$i \leq 0.5$ mA Peak	Exposed accessible parts

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

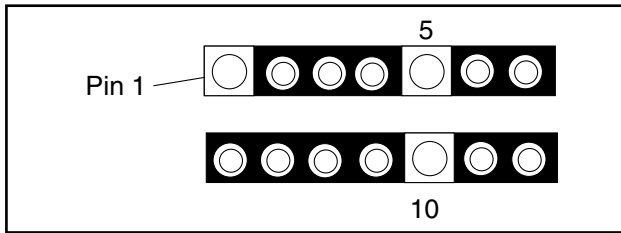
STANDARD NOTES FOR SERVICING

Circuit Board Indications

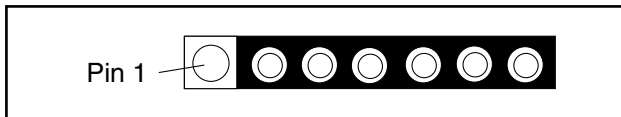
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



2. For other ICs, pin 1 and every fifth pin are indicated as shown.

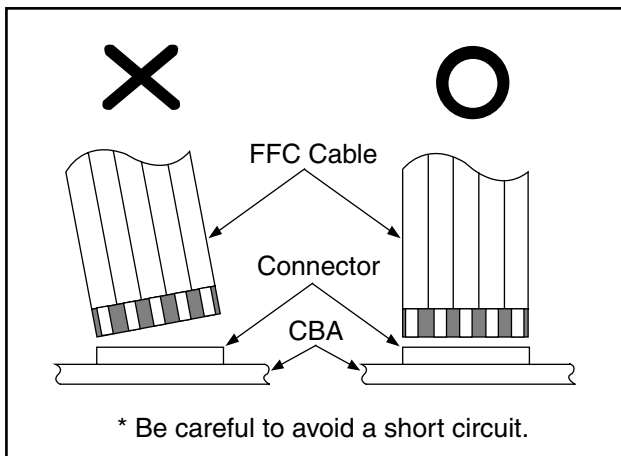


3. The 1st pin of every male connector is indicated as shown.



Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.



Pb (Lead) Free Solder

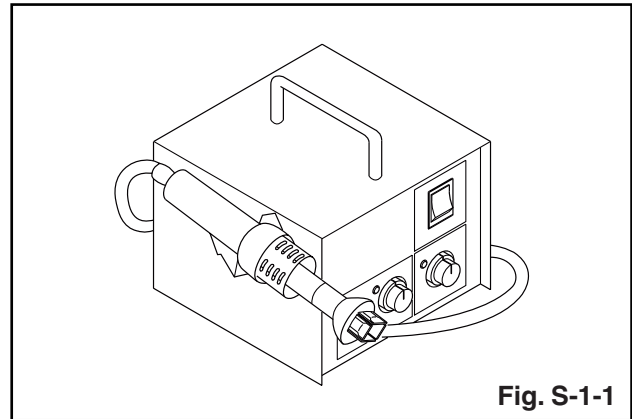
When soldering, be sure to use the Pb free solder.

How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

1. Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

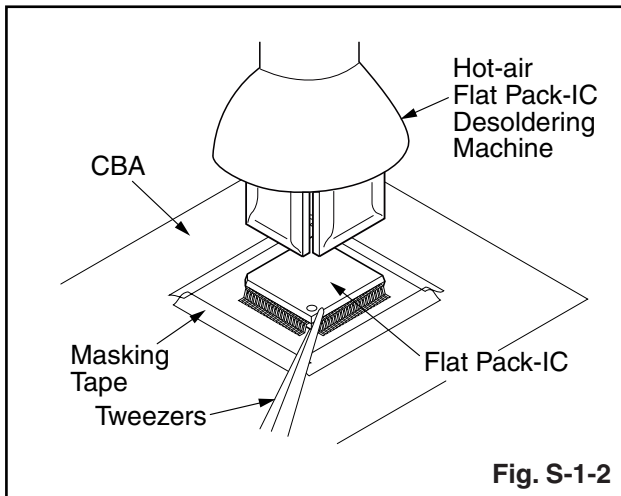


2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

CAUTION:

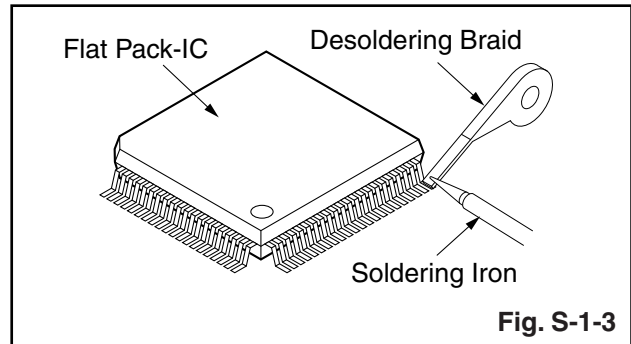
1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)

3. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

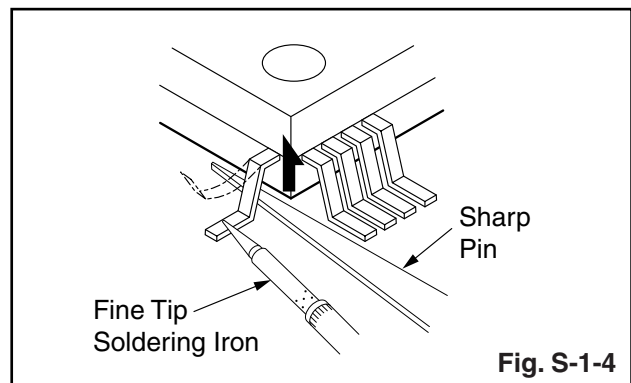


With Soldering Iron:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)



2. Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

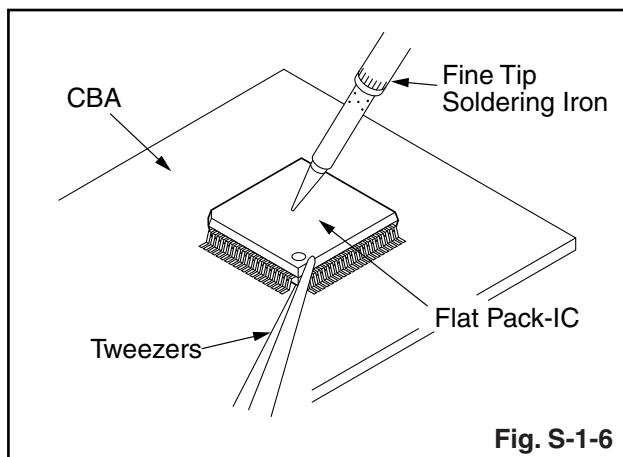
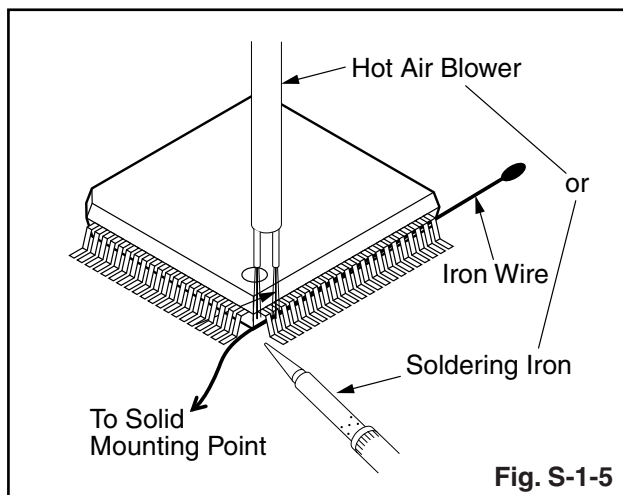


3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

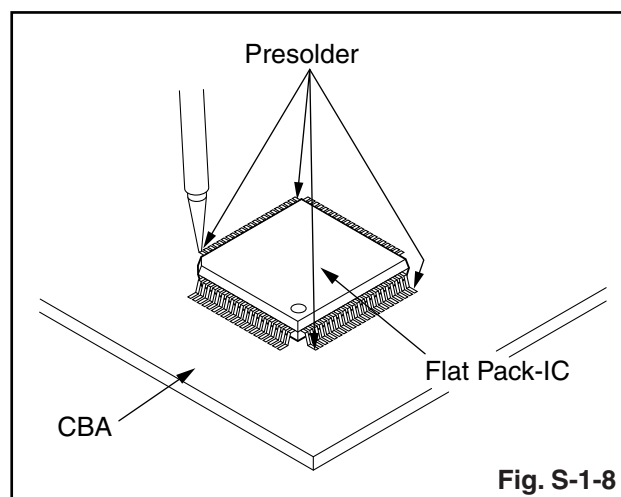
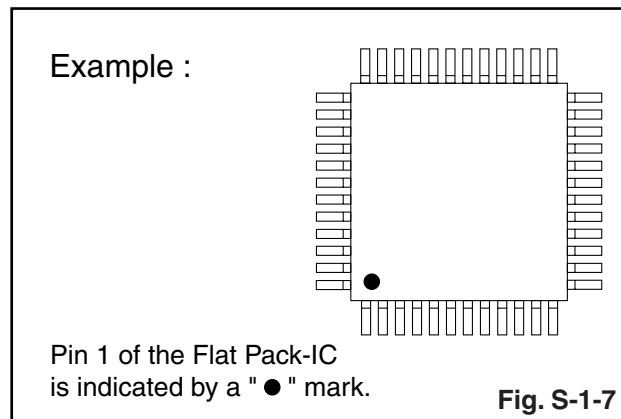
1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.
4. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
5. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Note: When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.



2. Installation

1. Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.
2. The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)
3. Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.



Instructions for Handling Semi-conductors

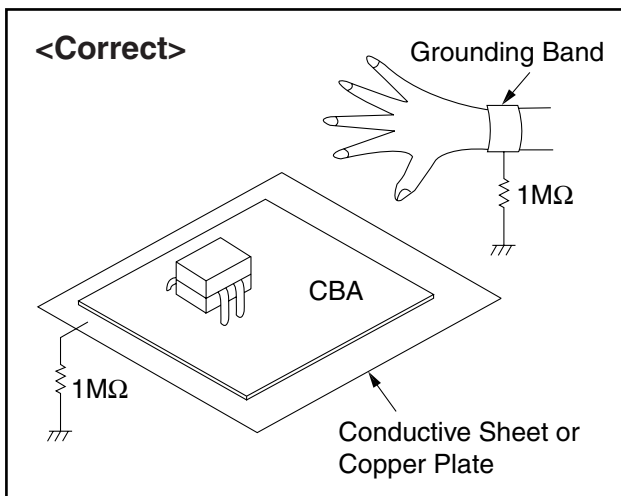
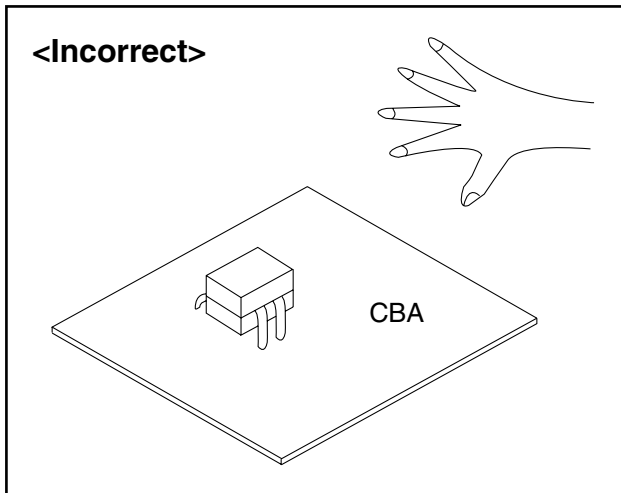
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

1. Ground for Human Body

Be sure to wear a grounding band ($1\text{ M}\Omega$) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

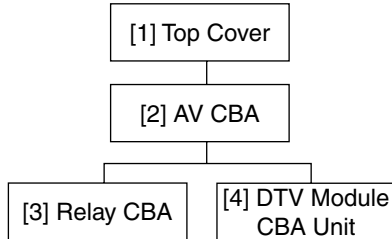
Be sure to place a conductive sheet or copper plate with proper grounding ($1\text{ M}\Omega$) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.



CABINET DISASSEMBLY INSTRUCTIONS

1. Disassembly Flowchart

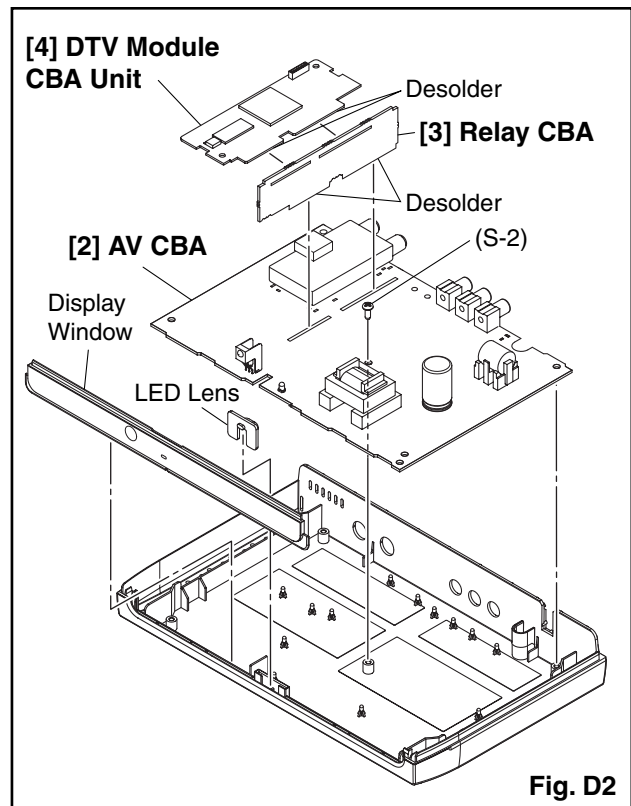
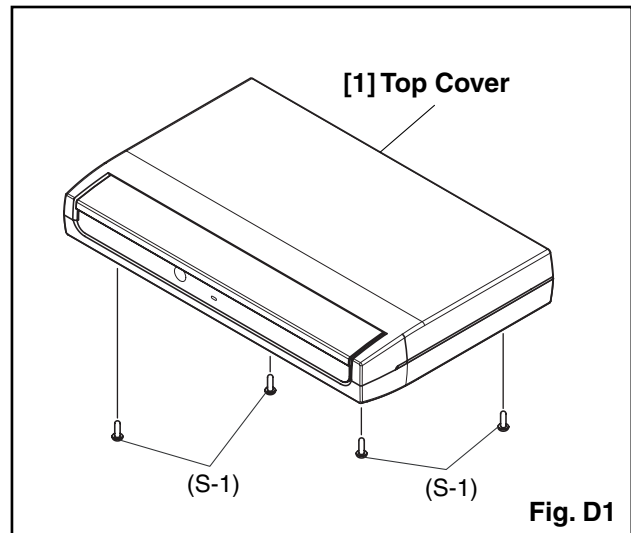
This flowchart indicates the disassembly steps to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route, and dress the cables as they were originally.



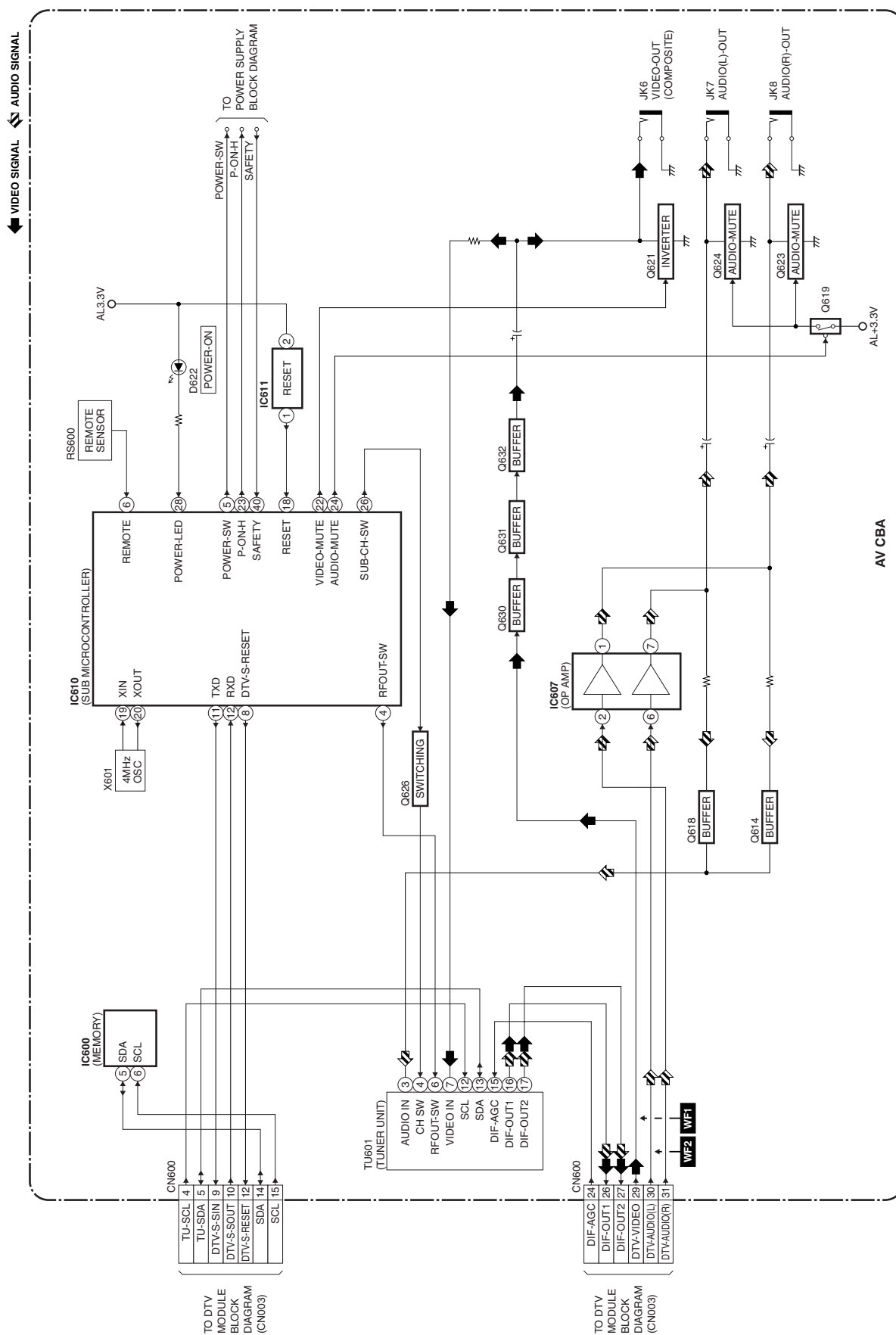
2. Disassembly Method

ID/ LOC. No.	PART	REMOVAL		
		Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	Note
[1]	Top Cover	D1	4(S-1)	-
[2]	AV CBA	D2	(S-2), Display Window, LED Lens	-
[3]	Relay CBA	D2	Desolder	-
[4]	DTV Module CBA Unit	D2	Desolder	-
		↓	↓	↓
		(1)	(2)	(3)
		↓	↓	↓
		(4)	(5)	

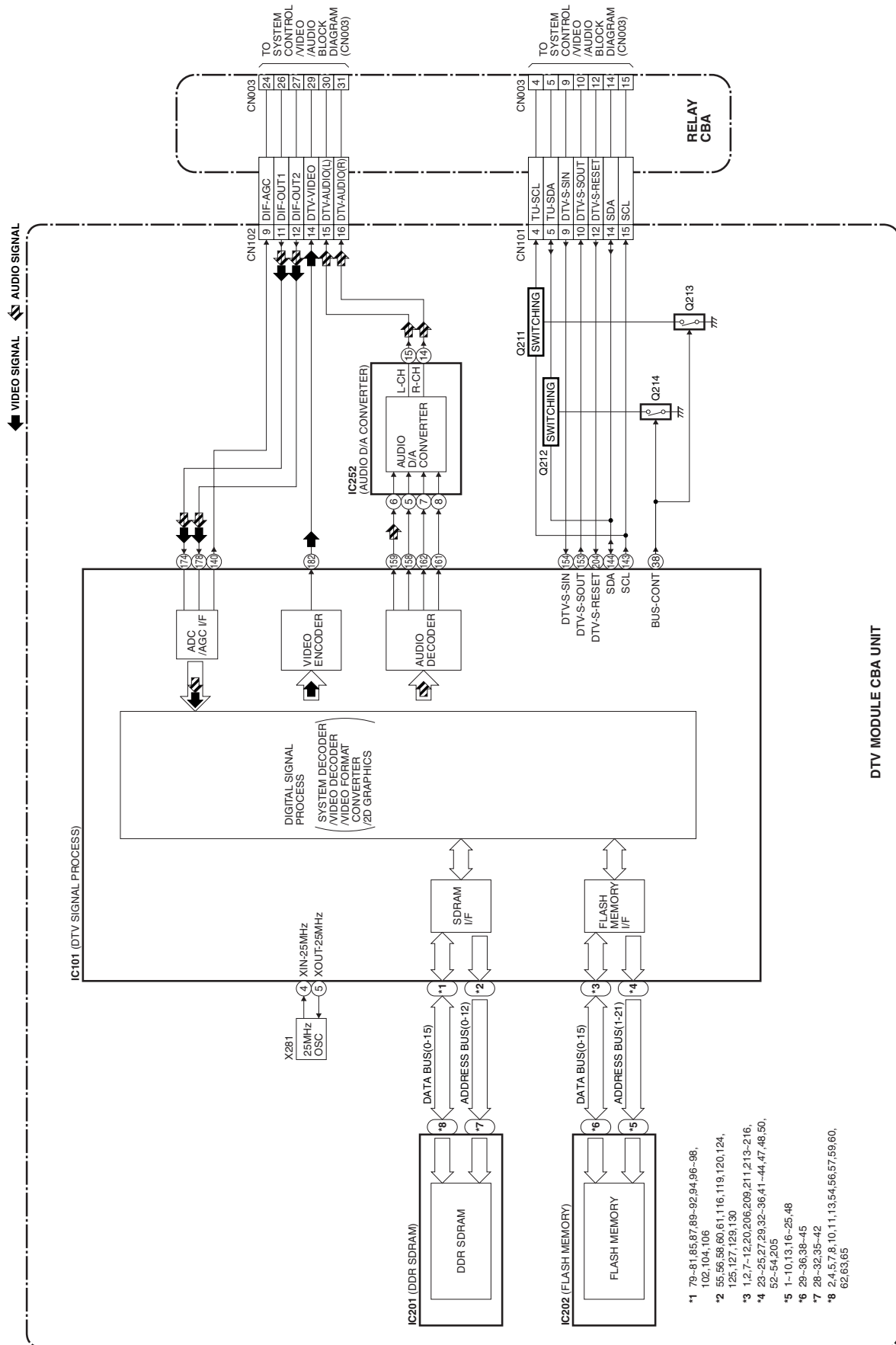
- (1): Identification (location) No. of parts in the figures
 (2): Name of the part
 (3): Figure Number for reference
 (4): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
 P=Spring, L=Locking Tab, S=Screw,
 CN=Connector, W=Washer, N=Nut,
 *=Unhook, Unlock, Release, Unplug, or Desolder
 e.g. 4(S-2) = four Screws (S-2),
 6(L-1) = six Locking Tabs (L-2)
 (5): Refer to "Reference Notes."



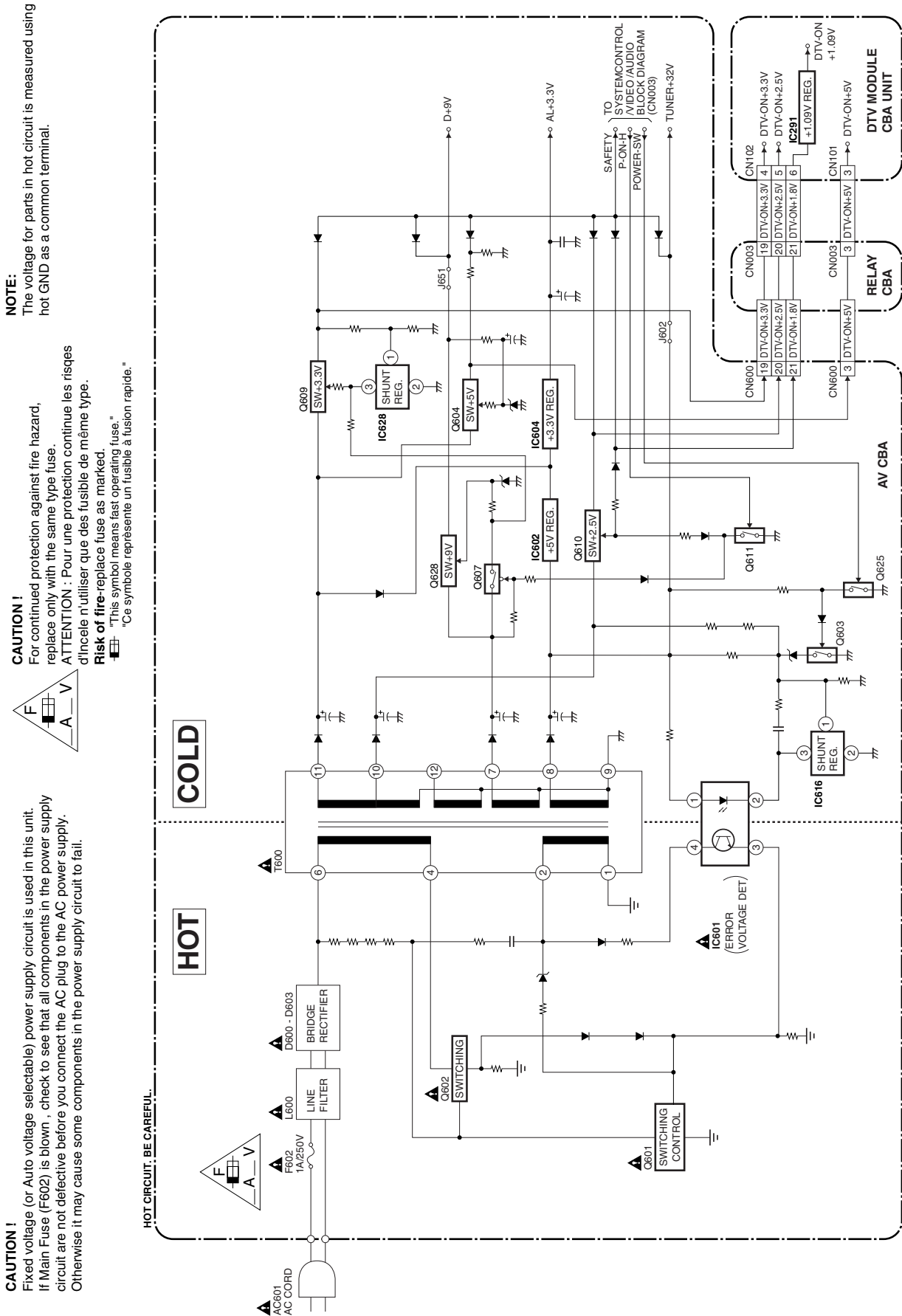
System Control /VIDEO /AUDIO Block Diagram



DTV Module Block Diagram



Power Supply Block Diagram



SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

Standard Notes

WARNING

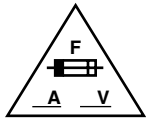
Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark "▲" in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K = 10^3$, $M = 10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P = 10^{-6} \mu F$).
5. All voltages are DC voltages unless otherwise specified.

LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION:



FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCELE N'UTILISER QUE DES FUSIBLE DE MÊME TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.



This symbol means fast operating fuse.
Ce symbole représente un fusible à fusion rapide.

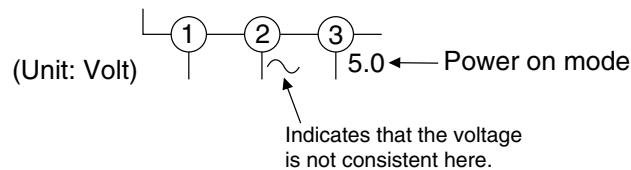
2. CAUTION:

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F602) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. Note:

- Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
- To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Voltage indications for Power on mode on the schematics are as shown below:

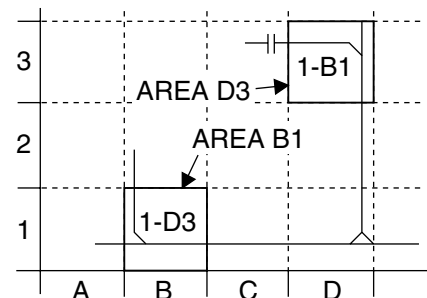


5. How to read converged lines

1-D3
↑
Distinction Area
Line Number
(1 to 3 digits)

Examples:

- "1-D3" means that line number "1" goes to the line number "1" of the area "D3".
- "1-B1" means that line number "1" goes to the line number "1" of the area "B1".



6. Test Point Information



: Indicates a test point with a jumper wire across a hole in the PCB.



: Used to indicate a test point with a component lead on foil side.



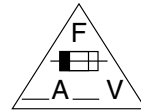
: Used to indicate a test point with no test pin.



: Used to indicate a test point with a test pin.

4
—
3
—
2
—
1


Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F602) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.



CAUTION !

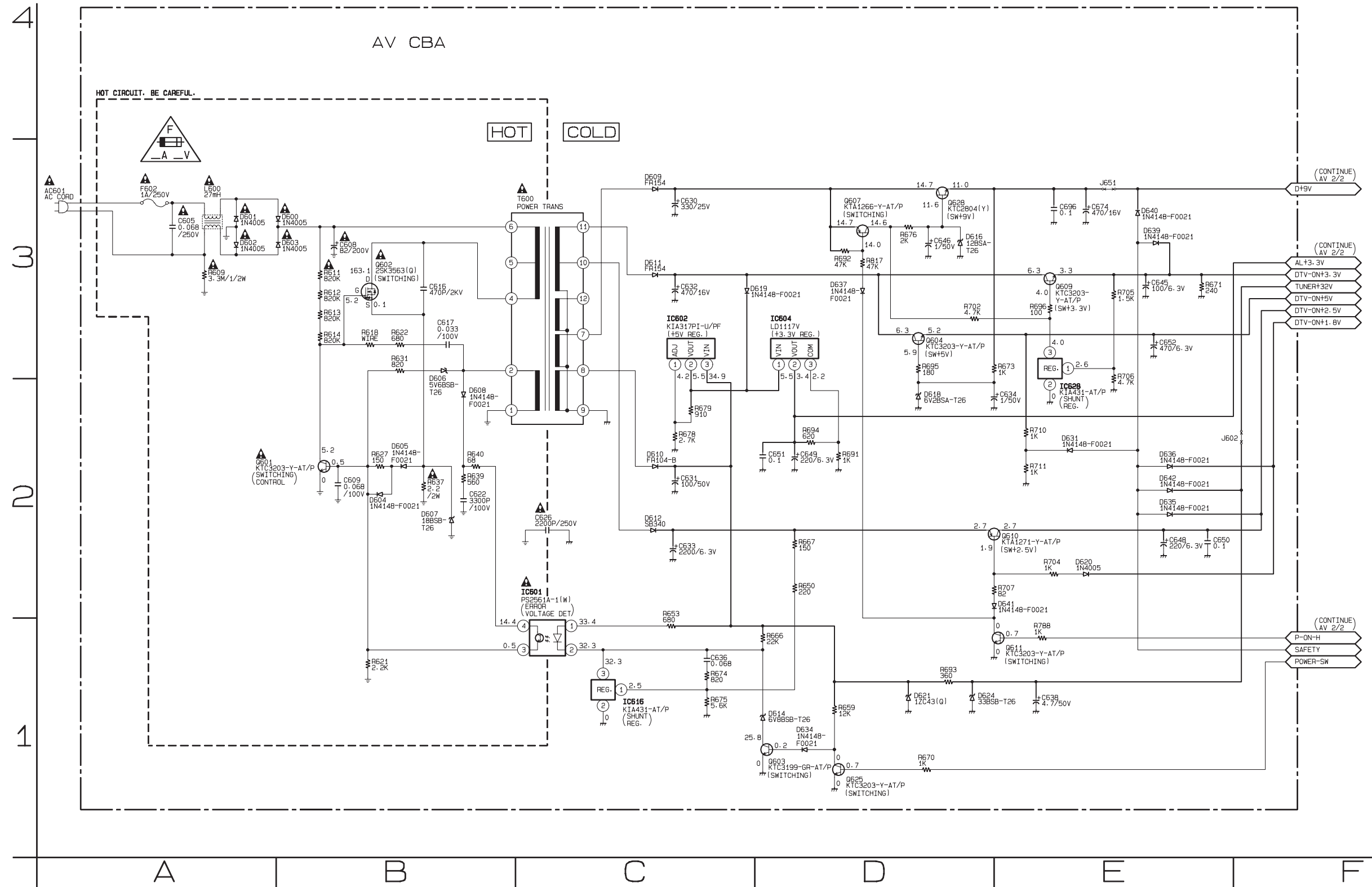
For continued protection against fire hazard,
replace only with the same type fuse.
ATTENTION : Pour une protection continue les risques
d'Inceste n'utiliser que des fusible de même type.

Risk of fire-replace fuse as marked.

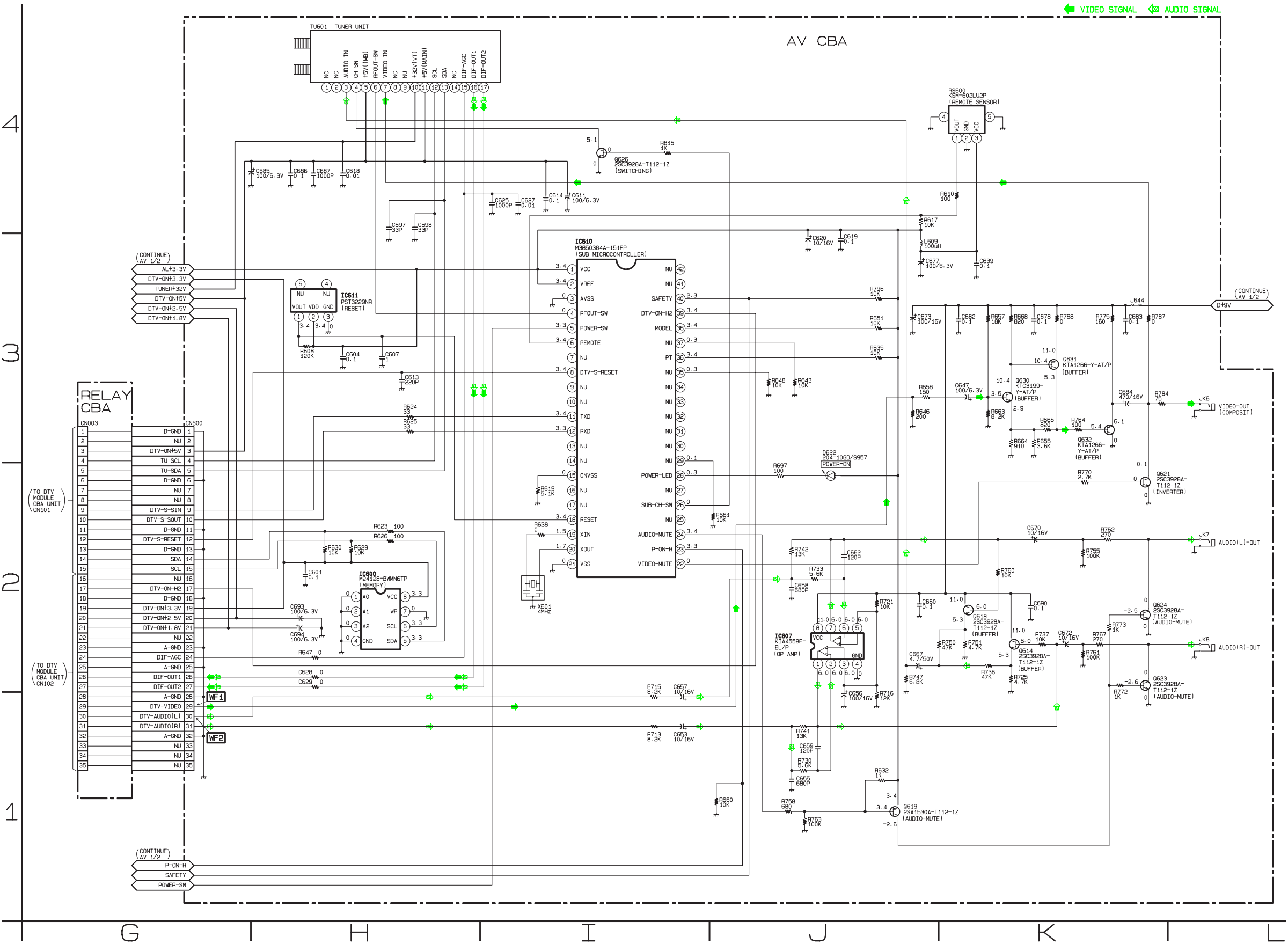
 "This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

NOTE:

The voltage for parts in hot circuit is measured using hot GND as a common terminal.



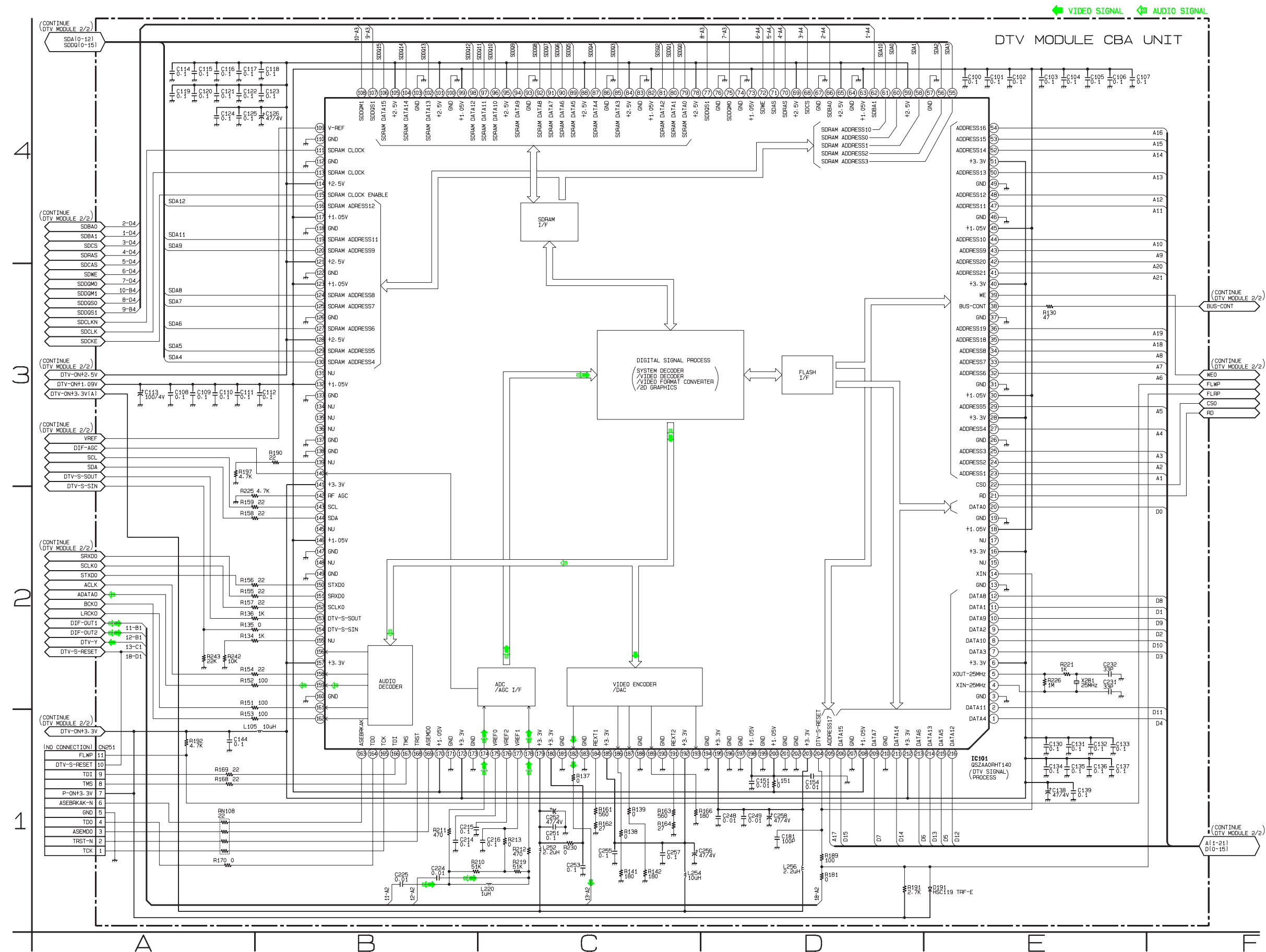
AV 2/2 & Relay Schematic Diagram



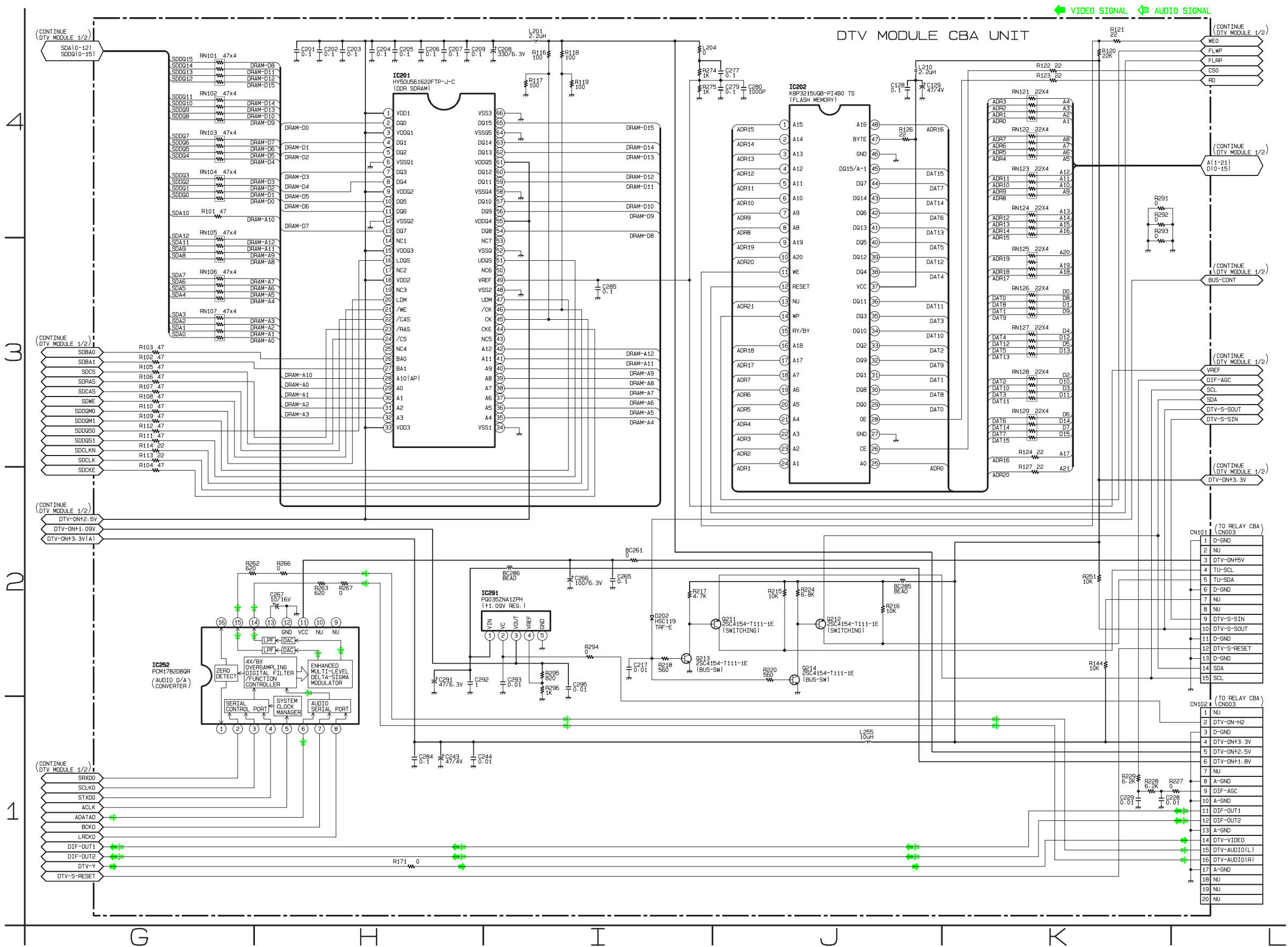
VOLTAGE CHART

CN600	
Pin No.	Voltage
1	0
2	---
3	5.1
4	3.3
5	3.3
6	0
7	---
8	---
9	3.4
10	3.3
11	0
12	3.4
13	0
14	3.3
15	3.3
16	---
17	3.5
18	0
19	3.3
20	2.6
21	1.8
22	---
23	0
24	~
25	0
26	0
27	0
28	0
29	0.4
30	2.5
31	2.5
32	0
33	---
34	---
35	---

DTV Module 1/2 Schematic Diagram

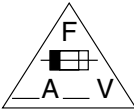


DTV Module 2/2 Schematic Diagram



AV CBA Top View

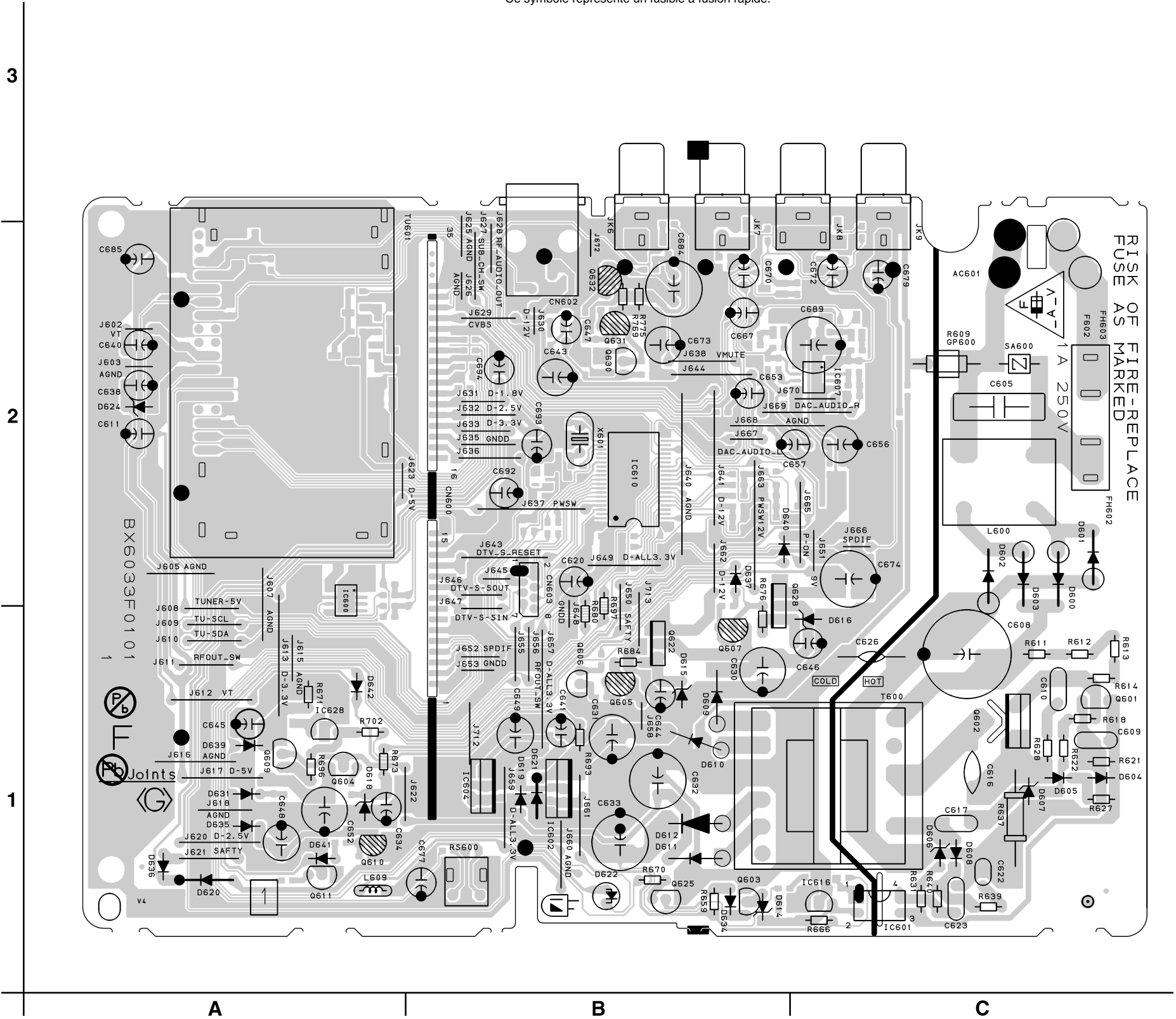
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F602) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.



CAUTION !
For continued protection against fire hazard,
replace only with the same type fuse.
ATTENTION : Pour une protection continue les risques
d'Incele n'utiliser que des fusible de même type.
Risk of fire-replace fuse as marked.
■ "This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

NOTE:
The voltage for parts in hot circuit is measured using
hot GND as a common terminal.

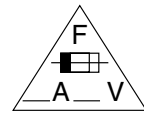
Because a hot chassis ground is present in the power
supply circuit, an isolation transformer must be used.
Also, in order to have the ability to increase the input
slowly,when troubleshooting this type power supply
circuit, a variable isolation transformer is required.



AV CBA Bottom View

CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F602) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.



CAUTION !

For continued protection against fire hazard,
replace only with the same type fuse.

ATTENTION : Pour une protection continue les risques d'Incele n'utiliser que des fusible de même type.

Risk of fire-replace fuse as marked.

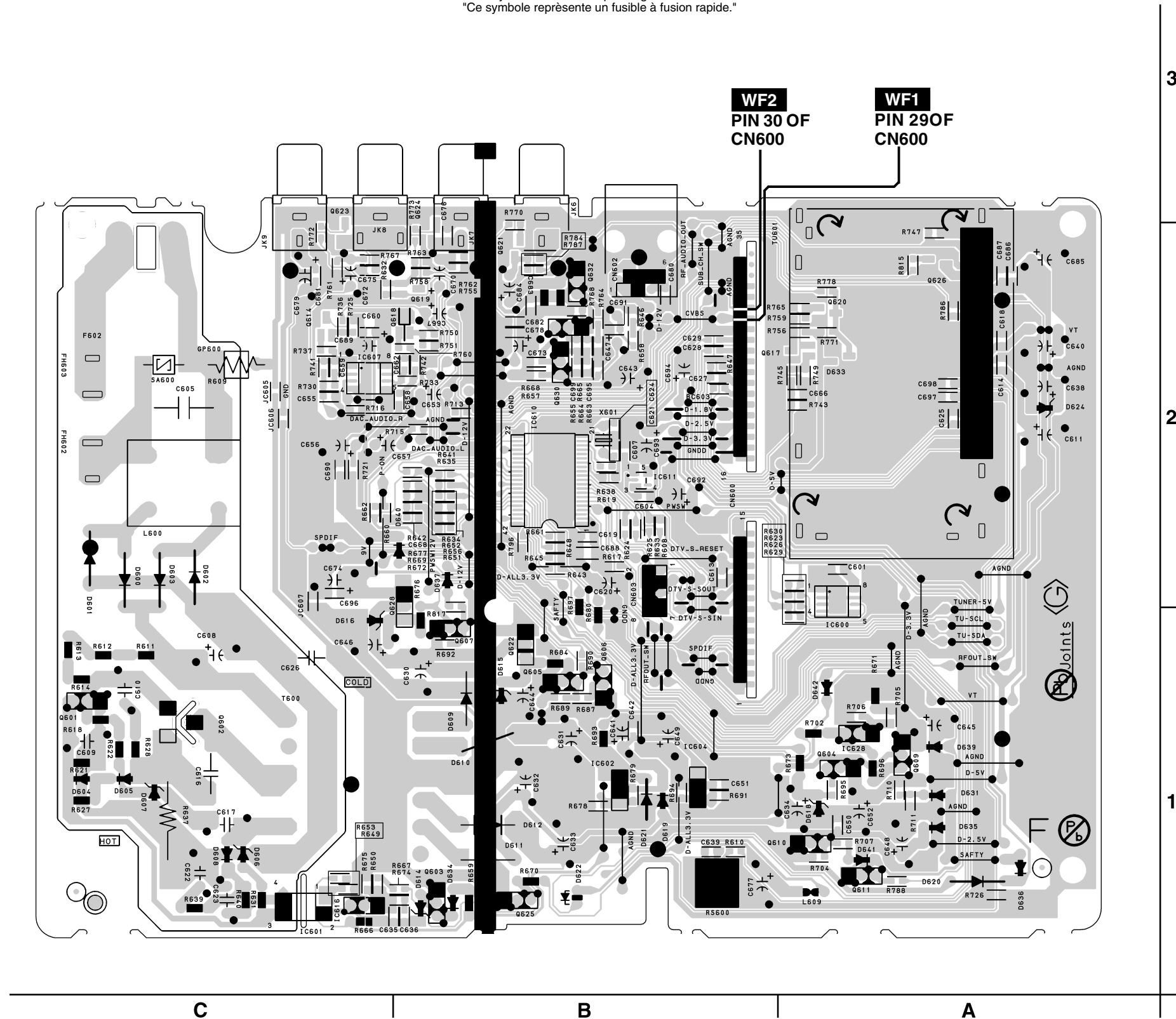
 "This symbol means fast operating fuse."

"Ce symbole représente un fusible à fusion rapide."

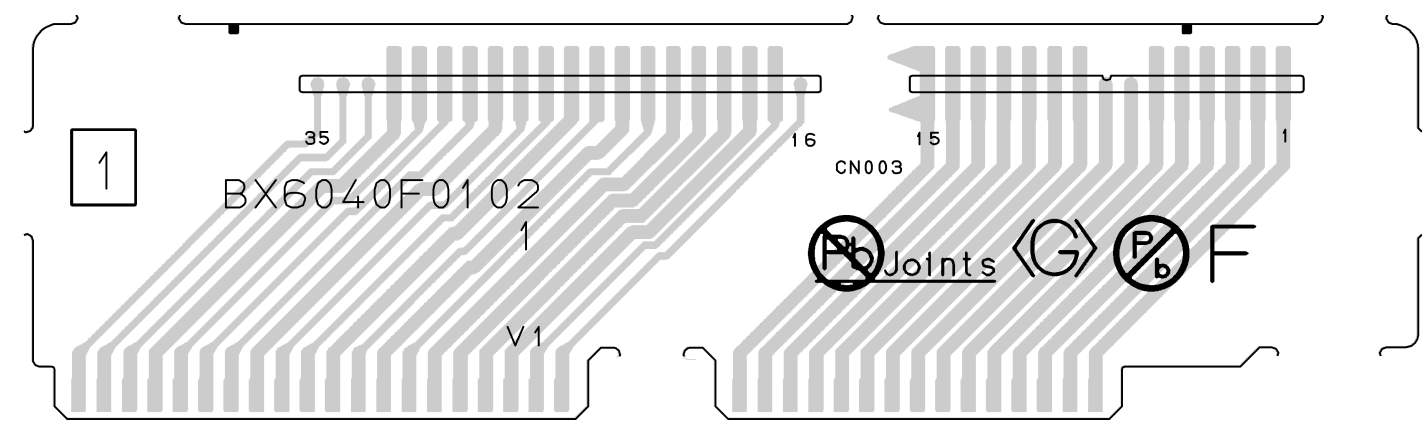
NOTE:

The voltage for parts in hot circuit is measured using hot GND as a common terminal.

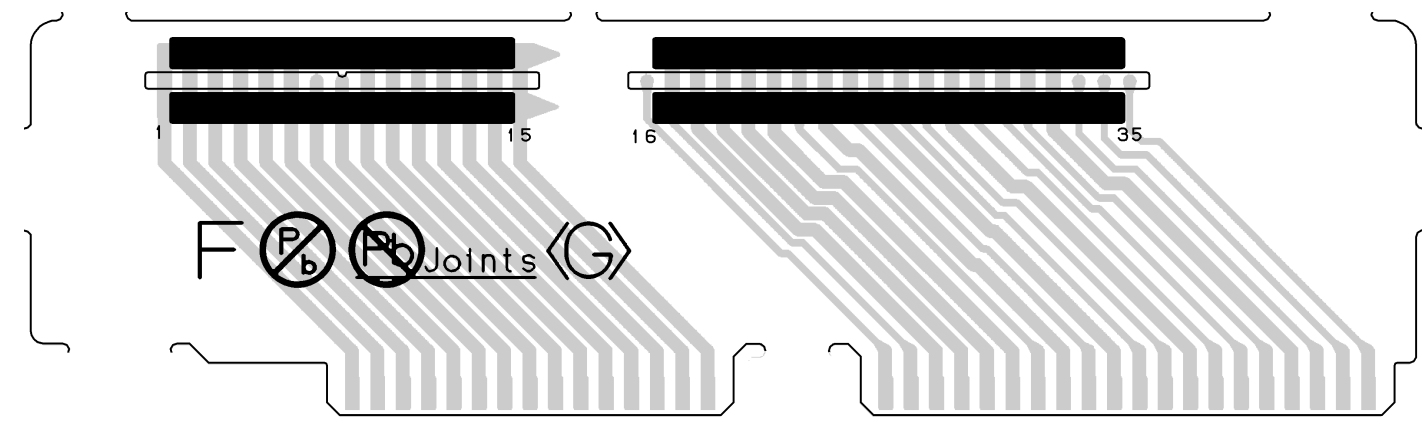
Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly, when troubleshooting this type power supply circuit, a variable isolation transformer is required.



Relay CBA Top View



Relay CBA Bottom View

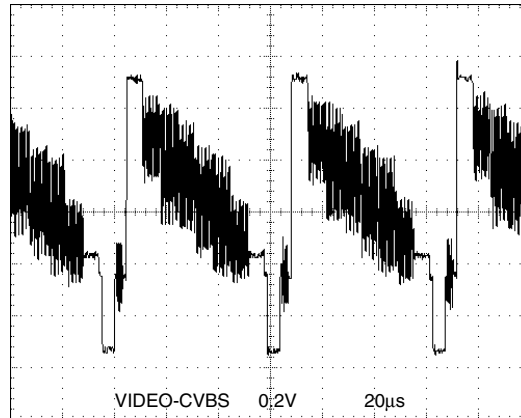


WAVEFORMS

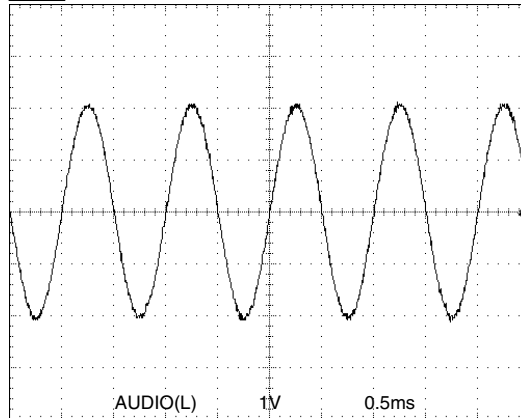
NOTE:

Input: ATSC 8 Color Bar Signal (with 1KHz (0dBFS)Audio Signal)

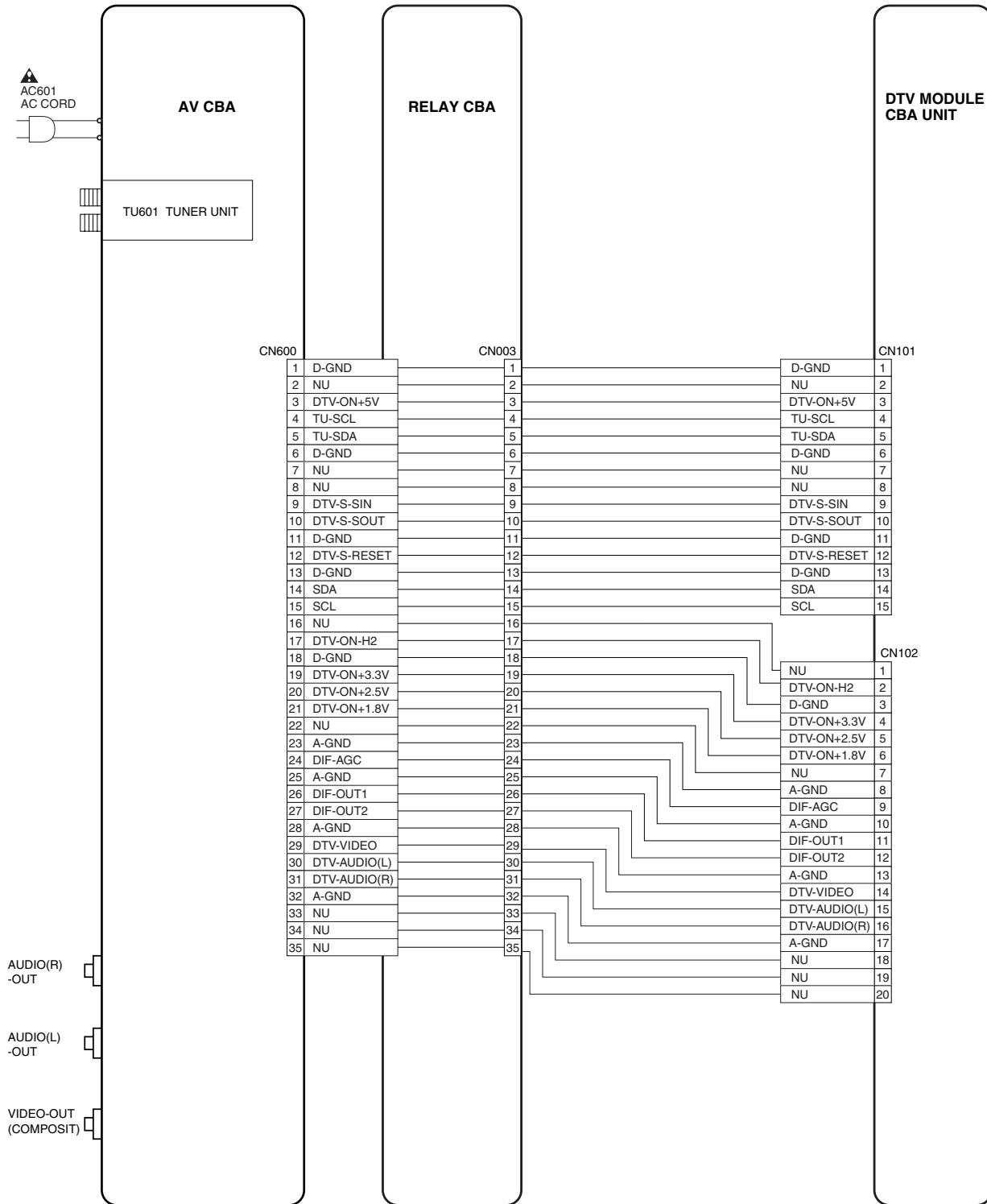
WF1 Pin 29 of CN600



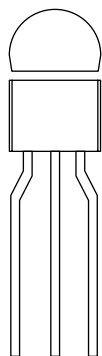
WF2 Pin 30 of CN600



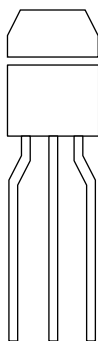
WIRING DIAGRAM



LEAD IDENTIFICATIONS

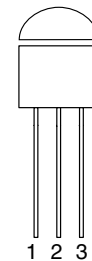


KTA1266-Y-AT/P
KTA1271-Y-AT/P
KTC3203-Y-AT/P



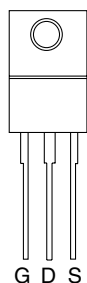
KTC3199-(GR,Y)-AT/P

KIA431-AT/P



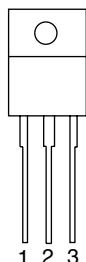
1: R
2: A
3: K

2SK3563(Q)



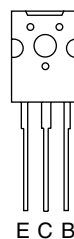
G D S

LD1117V



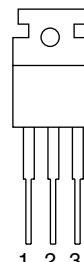
1: VIN
2: VOUT
3: COM

KTC2804(Y)



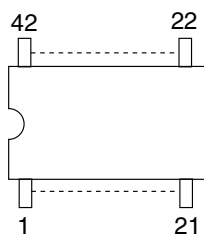
E C B

KIA317PI-U/PF



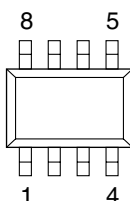
1: ADJ
2: OUTPUT
3: INPUT

M38503G4A-151FP



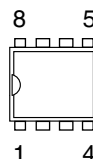
1 21

M24128-BWMN6TP



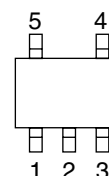
1 4

KIA4558F-EL/P



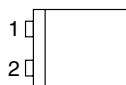
1 4

PST3229NR



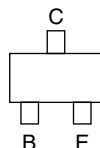
1 2 3

PS2561A-1(W)



1: Anode
2: Cathode
3: Emitter
4: Collector

2SA1530A-T112-1Z
2SC3928A-T112-1Z



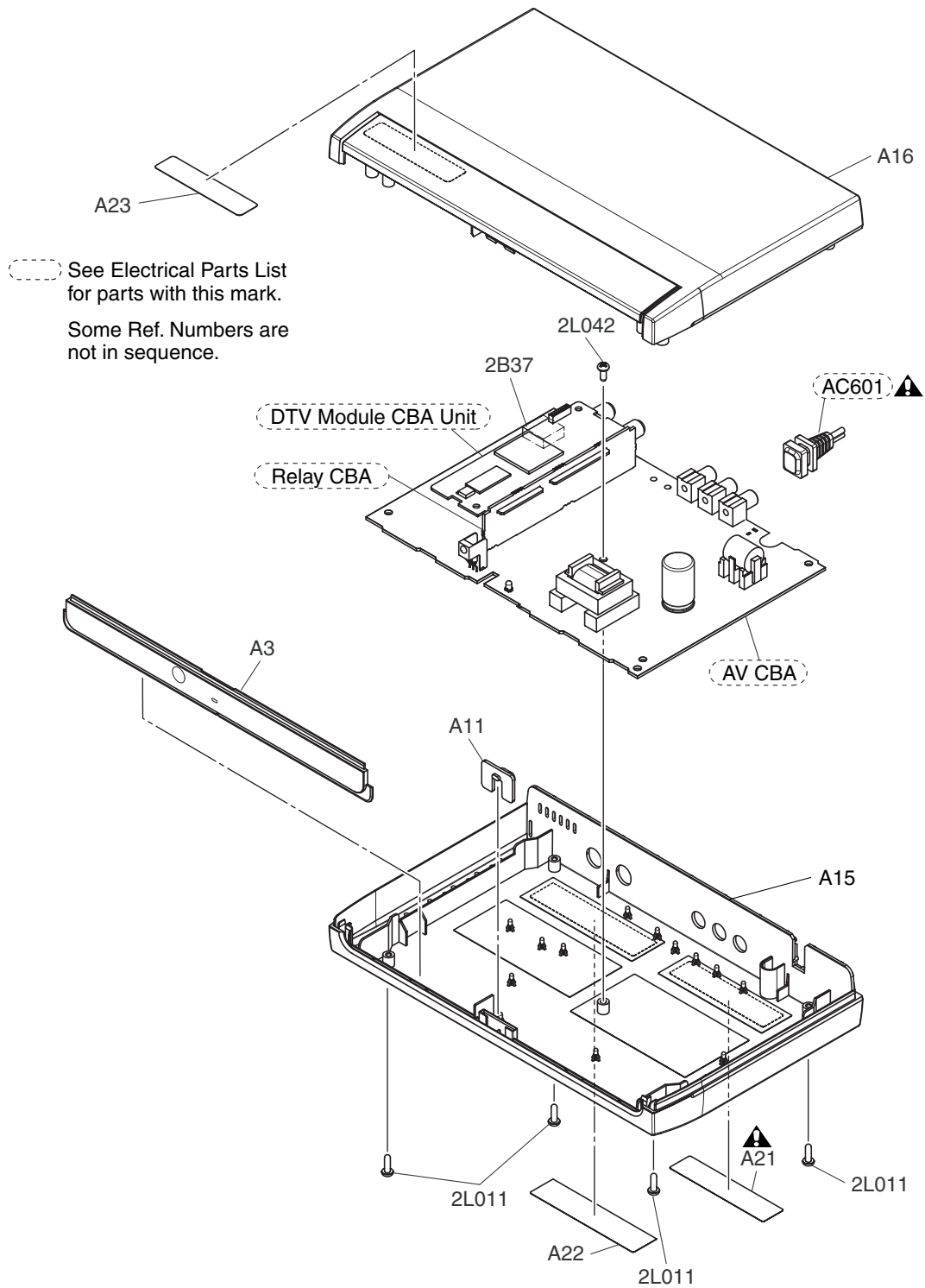
B E

Note:

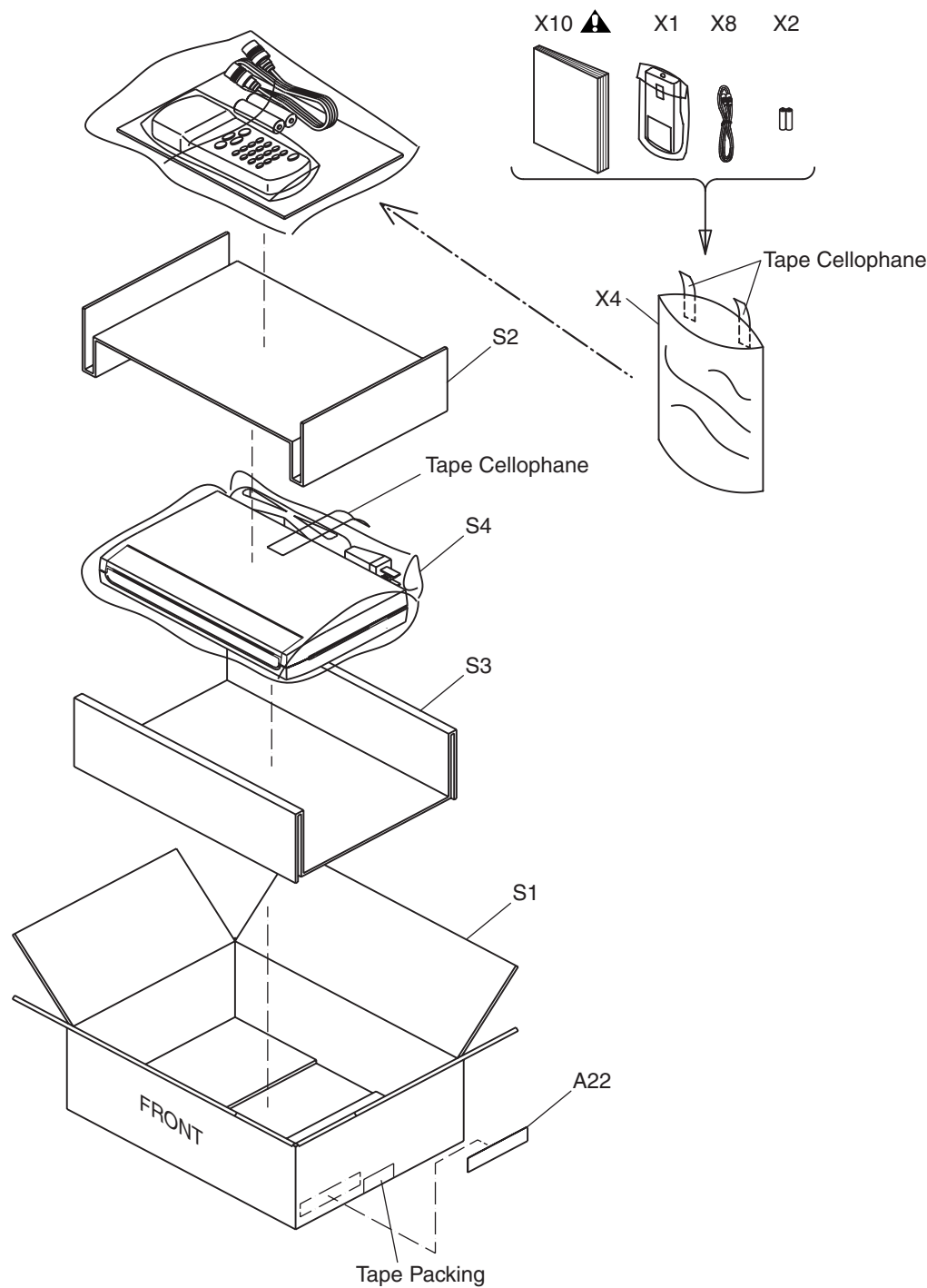
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
G: Gate
D: Drain
S: Source

EXPLODED VIEWS


Cabinet



Packing




MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTE: Parts that are not assigned part numbers (-----) are not available.

Ref. No.	Description	Part No.
A3	DISPLAY WINDOW X6030UD	1VM324048
A11	LED LENS X6030UD	1VM324049A
A15	CHASSIS ASSEMBLY X6030UD	1VM427839
A16	TOP CASE X6032UD	1VM324618
A21 	MODEL NO. LABEL X6032UD	-----
A22	BARCODE LABEL(PLAIN_3PCS) X6033UD	-----
A23	TELEPHONE NO. LABEL E8CK0UD	-----
2B37	CUSHION HC460ED	0VM413251
2L011	SCREW P-TIGHT M3X10 BIND HEAD+	GBJP3100
2L042	SCREW P-TIGHT M3X8 BIND HEAD+	GBJP3080
PACKING		
S1	GIFT BOX CARTON X6032UD	1VM324841
S2	PAD TOP X6030UD	1VM323996
S3	PAD BOTTOM X6030UD	1VM323997
S4	UNIT BAG X6040UD	1VM427763
ACCESSORIES		
X1	REMOTE CONTROL UNIT NA382UD	NA382UD
X2	DRY BATTERY 2PACK R6-B500/01S	XB0M142CZB01
X4	ACCESSORY BAG E5700UD	0VM415576
X8	RF CORD WPZ0901TM005	WPZ0901TM005
X10 	OWNERS MANUAL X6032UD	1VMN24077

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTES:

- Parts that are not assigned part numbers (-----) are not available.
- Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%
 G.....±2% J.....±5% K.....±10%
 M.....±20% N.....±30% Z.....+80/-20%

AV ASSEMBLY

Ref. No.	Description	Part No.
	AV ASSEMBLY Consists of the following:	1VSA17705
	DTV MODULE CBA UNIT AV CBA RELAY CBA	1VSA16989 ----- BX6040F01021

AV CBA

Ref. No.	Description	Part No.
	AV CBA Consists of the following:	-----
CAPACITORS		
C601	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C604	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C605▲	ACROSS THE LINE CAP. 0.068µF/250V	CT2E683DC016
C607	CHIP CERAMIC CAP. (1608) B K 1µF/16V	CHD1CK30B105
C608▲	ELECTROLYTIC CAPACITOR ZR200TA820M12BB	CA2D820DYG01
C609	POLYESTER FILM CAP. (PB FREE) 0.068µF/ 100V J	CA2A683DT018
C611	ELECTROLYTIC CAP. 100µF/6.3V M	CE0KMASDL101
C613	CHIP CERAMIC CAP. CH J 220pF/50V	CHD1JJ3CH221
C614	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C616	CERAMIC CAP. HR 470pF/2KV	CCD3DKP0R471
C617	POLYESTER FILM CAP. (PB FREE) 0.033µF/ 100V J	CA2A333DT018
C618	CHIP CERAMIC CAP. F Z 0.01µF/50V	CHD1JZ30F103
C619	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C620	ELECTROLYTIC CAP. 10µF/16V M	CE1CMASDL100
C622	POLYESTER FILM CAP. (PB FREE) 0.0033µF/ 100V J	CA2A332DT018
C625	CHIP CERAMIC CAP.(1608) CH J 1000pF/50V	CHD1JJ3CH102
C626▲	CAP SAFETY 2200pF 250V Y	CA2E222MR064
C627	CHIP CERAMIC CAP. F Z 0.01µF/50V	CHD1JZ30F103
C628	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
C629	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
C630	ELECTROLYTIC CAP. 330µF/25V M	CE1EMASDL331
C631	ELECTROLYTIC CAP. 100µF/50V M	CE1JMASDL101
C632	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C633	ELECTROLYTIC CAP. 2200µF/6.3V SL	CE0KMZADL222
C634	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL1R0

Ref. No.	Description	Part No.
C636	CHIP CERAMIC CAP. B K 0.068µF/50V	CHD1JK30B683
C638	ELECTROLYTIC CAP. 4.7µF/50V M	CE1JMASDL4R7
C639	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C645	ELECTROLYTIC CAP. 100µF/6.3V M H7	CE0KMASDL101
C646	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL1R0
C647	ELECTROLYTIC CAP. 100µF/6.3V M	CE0KMASDL101
C648	ELECTROLYTIC CAP. 220µF/6.3V M	CE0KMASDL221
C649	ELECTROLYTIC CAP. 220µF/6.3V M	CE0KMASDL221
C650	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C651	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C652	ELECTROLYTIC CAP. 470µF/6.3V M	CE0KMASDL471
C653	ELECTROLYTIC CAP. 10µF/16V M	CE1CMASDL100
C655	CHIP CERAMIC CAP. CH J 680pF/50V	CHD1JJ3CH681
C656	ELECTROLYTIC CAP. 100µF/16V M	CE1CMASDL101
C657	ELECTROLYTIC CAP. 10µF/16V M	CE1CMASDL100
C658	CHIP CERAMIC CAP. CH J 680pF/50V	CHD1JJ3CH681
C659	CHIP CERAMIC CAP. CH J 120pF/50V	CHD1JJ3CH121
C660	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C662	CHIP CERAMIC CAP. CH J 120pF/50V	CHD1JJ3CH121
C667	ELECTROLYTIC CAP. 4.7µF/50V M	CE1JMASDL4R7
C670	ELECTROLYTIC CAP. 10µF/16V M	CE1CMASDL100
C672	ELECTROLYTIC CAP. 10µF/16V M	CE1CMASDL100
C673	ELECTROLYTIC CAP. 100µF/16V M	CE1CMASDL101
C674	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C677	ELECTROLYTIC CAP. 100µF/6.3V M	CE0KMASDL101
C678	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C682	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C683	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C684	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C685	ELECTROLYTIC CAP. 100µF/6.3V M H7	CE0KMASDL101
C686	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C687	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C690	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C693	ELECTROLYTIC CAP. 100µF/6.3V M	CE0KMASDL101
C694	ELECTROLYTIC CAP. 100µF/6.3V M	CE0KMASDL101
C696	CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V	CHD1EZ30F104
C697	CHIP CERAMIC CAP.(1608) CH J 33pF/50V	CHD1JJ3CH330
C698	CHIP CERAMIC CAP.(1608) CH J 33pF/50V	CHD1JJ3CH330
DIODES		
D600▲	RECTIFIER DIODE 1N4005	NDQZ001N4005
D601▲	RECTIFIER DIODE 1N4005	NDQZ001N4005
D602▲	RECTIFIER DIODE 1N4005	NDQZ001N4005
D603▲	RECTIFIER DIODE 1N4005	NDQZ001N4005
D604	DIODE SWITCHING 1N4148-F0021	NDTZO1N4148F
D605	DIODE SWITCHING 1N4148-F0021	NDTZO1N4148F
D606	DIODE ZENER 5V6BSB-T26	NDTB5R6BST26
D607	DIODE ZENER 18BSB-T26	NDTB018BST26
D608	DIODE SWITCHING 1N4148-F0021	NDTZO1N4148F
D609	DIODE FR154	NDLZ000FR154
D610	DIODE FR104-B	NDLZ000FR104
D611	DIODE FR154	NDLZ000FR154
D612	SCHOTTKY BARRIER DIODE SB340	NDQZ000SB340
D614	DIODE ZENER 6V8BSB-T26	NDTB6R8BST26
D616	DIODE ZENER 12BSA-T26	NDTA012BST26
D618	DIODE ZENER 6V2BSA-T26	NDTA6R2BST26
D619	DIODE SWITCHING 1N4148-F0021	NDTZO1N4148F
D620	RECTIFIER DIODE 1N4005	NDQZ001N4005
D621	DIODE 1ZC43(Q)	QDLZ001ZC43Q
D622	LED(GREEN) 204-10GD/S957	NPQZ10GDS957

Ref. No.	Description	Part No.
D624	DIODE ZENER 33BSB-T26	NDTB033BST26
D631	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D634	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D635	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D636	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D637	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D639	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D640	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D641	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
D642	DIODE SWITCHING 1N4148-F0021	NDT01N4148F
ICS		
IC600	EEP-ROM 128K M24128-BWMN6TP	NSZBA0TSS268
IC601▲	PHOTOCOUPLER PS2561A-1(W)	QPEWPS2561A1
IC602	IC REGULATOR KIA317PI-U/PF	NSZBA0SJY061
IC604	IC LD1117V	NSZBA0SS046
IC607	IC OPAMP KIA4558F-EL/P FLP 8P	NSZBA0TJY057
IC610	IC 8-BIT CMOS MICROCOMPUTER M38503G4A-151FP	QSZAA0SHT177
IC611	IC RESET IC-PST3229NR	QSZBA0TMM093
IC616	IC SHUNT REGULATOR KIA431-AT/P	NSZBA0TJY036
IC628	IC SHUNT REGULATOR KIA431-AT/P	NSZBA0TJY036
COILS		
L600▲	COIL LINE FILTER LF199A 27MH	LLEG0Z0Y2001
L609	INDUCTOR 100μH-K-5FT	LLARKBSTU101
TRANSISTORS		
Q601▲	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q602▲	FET MOS 2SK3563(Q)	QFWZ2SK3563Q
Q603	TRANSISTOR KTC3199-GR-AT/P	NQS4KTC3199P
Q604	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q607	TRANSISTOR KTA1266-Y-AT/P	NQSYKTA1266P
Q609	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q610	TRANSISTOR (PB FREE) KTA1271-Y-AT/P	NQSYKTA1271P
Q611	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q614	CHIP TRANSISTOR 2SC3928A-T112-1Z	QQ1Z2SC3928A
Q618	CHIP TRANSISTOR 2SC3928A-T112-1Z	QQ1Z2SC3928A
Q619	CHIP TRANSISTOR 2SA1530A-T112-1Z	QQ1Z2SA1530A
Q621	CHIP TRANSISTOR 2SC3928A-T112-1Z	QQ1Z2SC3928A
Q623	CHIP TRANSISTOR 2SC3928A-T112-1Z	QQ1Z2SC3928A
Q624	CHIP TRANSISTOR 2SC3928A-T112-1Z	QQ1Z2SC3928A
Q625	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q626	CHIP TRANSISTOR 2SC3928A-T112-1Z	QQ1Z2SC3928A
Q628	TRANSISTOR KTC2804(Y)	NQYQYKTC2804
Q630	TRANSISTOR KTC3199-Y-AT/P	NQSYKTC3199P
Q631	TRANSISTOR KTA1266-Y-AT/P	NQSYKTA1266P
Q632	TRANSISTOR KTA1266-Y-AT/P	NQSYKTA1266P
RESISTORS		
R608	CHIP RES. 1/10W J 120k Ω	RRXAJR5Z0124
R609▲	GLASS GLAZE RES. 1/2W J 3.3M Ω	RXX2JZLZ0335
R610	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R611▲	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R612	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R613	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R614	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R617	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R618	PCB JUMPER D0.6-P5.0	JW5.0T
R619	CHIP RES. 1/10W J 5.1k Ω	RRXAJR5Z0512
R621	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R622	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R623	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R624	CHIP RES. 1/10W J 33 Ω	RRXAJR5Z0330
R625	CHIP RES. 1/10W J 33 Ω	RRXAJR5Z0330
R626	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R627	CARBON RES. 1/4W J 150 Ω	RCX4JATZ0151


Ref. No.	Description	Part No.
R629	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R630	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R631	CARBON RES. 1/4W J 820 Ω	RCX4JATZ0821
R632	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R635	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R637▲	METAL OXIDE FILM RES. 2W J 2.2 Ω	RN022R2ZU001
R638	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R639	CARBON RES. 1/4W J 560 Ω	RCX4JATZ0561
R640	CARBON RES. 1/4W J 68 Ω	RCX4JATZ0680
R643	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R646	CHIP RES. 1/10W J 200 Ω	RRXAJR5Z0201
R647	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R648	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R650	CHIP RES.(1608) 1/10W F 220 Ω	RRXAFR5H0221
R651	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R653	CHIP RES. 1/10W J 680 Ω	RRXAJR5Z0681
R655	CHIP RES. 1/10W J 3.6k Ω	RRXAJR5Z0362
R657	CHIP RES. 1/10W J 18k Ω	RRXAJR5Z0183
R658	CHIP RES. 1/10W J 150 Ω	RRXAJR5Z0151
R659	CARBON RES. 1/4W J 12k Ω	RCX4JATZ0123
R660	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R661	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R663	CHIP RES. 1/10W J 8.2k Ω	RRXAJR5Z0822
R664	CHIP RES.(1608) 1/10W F 910 Ω	RRXAFR5Z9100
R665	CHIP RES. 1/10W F 820 Ω	RRXAFR5H0821
R666	CARBON RES. 1/6W J 22k Ω	RCX6JATZ0223
R667	CHIP RES. 1/10W F 150 Ω	RRXAFR5H0151
R668	CHIP RES. 1/10W J 820 Ω	RRXAJR5Z0821
R670	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R671	CARBON RES. 1/6W J 240 Ω	RCX6JATZ0241
R673	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R674	CHIP RES. 1/10W J 820 Ω	RRXAJR5Z0821
R675	CHIP RES. 1/10W F 5.6k Ω	RRXAFR5H0562
R676	CARBON RES. 1/4W J 2k Ω	RCX4JATZ0202
R678	CHIP RES.(1608) 1/10W F 2.7k Ω	RRXAFR5H0272
R679	CHIP RES.(1608) 1/10W F 910 Ω	RRXAFR5Z9100
R691	CHIP RES.(1608) 1/10W F 1k Ω	RRXAFR5H0102
R692	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R693	CARBON RES. 1/4W J 360 Ω	RCX4JATZ0361
R694	CHIP RES. 1/10W F 620 Ω	RRXAFR5H0621
R695	CHIP RES. 1/10W J 180 Ω	RRXAJR5Z0181
R696	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R697	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R702	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R704	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R705	CHIP RES.(1608) 1/10W F 1.5k Ω	RRXAFR5H0152
R706	CHIP RES.(1608) 1/10W F 4.7k Ω	RRXAFR5H0472
R707	CHIP RES. 1/10W J 82 Ω	RRXAJR5Z0820
R710	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R711	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R713	CHIP RES.(1608) 1/10W F 8.2k Ω	RRXAFR5H0822
R715	CHIP RES.(1608) 1/10W F 8.2k Ω	RRXAFR5H0822
R716	CHIP RES. 1/10W J 12k Ω	RRXAJR5Z0123
R721	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R725	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R730	CHIP RES. 1/10W J 5.6k Ω	RRXAJR5Z0562
R733	CHIP RES. 1/10W J 5.6k Ω	RRXAJR5Z0562
R736	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
R737	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R741	CHIP RES.(1608) 1/10W F 13k Ω	RRXAFR5H0133
R742	CHIP RES.(1608) 1/10W F 13k Ω	RRXAFR5H0133
R747	CHIP RES. 1/10W J 6.8k Ω	RRXAJR5Z0682
R750	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473

Ref. No.	Description	Part No.
R751	CHIP RES. 1/10W J 4.7k Ω	RRXAJR5Z0472
R755	CHIP RES. 1/10W J 100k Ω	RRXAJR5Z0104
R758	CHIP RES. 1/10W J 680 Ω	RRXAJR5Z0681
R760	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R761	CHIP RES. 1/10W J 100k Ω	RRXAJR5Z0104
R762	CHIP RES. 1/10W J 270 Ω	RRXAJR5Z0271
R763	CHIP RES. 1/10W J 100k Ω	RRXAJR5Z0104
R764	CHIP RES. 1/10W J 100 Ω	RRXAJR5Z0101
R767	CHIP RES. 1/10W J 270 Ω	RRXAJR5Z0271
R768	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R770	CHIP RES. 1/10W J 2.7k Ω	RRXAJR5Z0272
R772	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R773	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R775	CARBON RES. 1/4W J 160 Ω	RCX4JATZ0161
R784	CHIP RES. 1/10W J 75 Ω	RRXAJR5Z0750
R787	CHIP RES.(1608) 1/10W 0 Ω	RRXAZR5Z0000
R788	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R796	CHIP RES. 1/10W J 10k Ω	RRXAJR5Z0103
R815	CHIP RES. 1/10W J 1k Ω	RRXAJR5Z0102
R817	CHIP RES. 1/10W J 47k Ω	RRXAJR5Z0473
MISCELLANEOUS		
AC601▲	AC CORD W/O A GND WIRE UL/CSA/1630/NO/BLACK	WAV0162LW002
F602▲	FUSE CURRENT PEG20C0NG001	PEG20C0NG001
FH602	FUSE HOLDER MSF-015 LF (B110)	XH01Z00LY002
FH603	FUSE HOLDER MSF-015 LF (B110)	XH01Z00LY002
JK6	RCA JACK(YELLOW) MTJ-032-05B-20(B110)	JXRL010LY135
JK7	RCA JACK(WHITE) MTJ-032-05B-22(B110)	JXRL010LY136
JK8	RCA JACK(RED) MTJ-032-05A-21(B110)	JYRL010LY029
RS600	SENSOR REMOTE RECEIVER KSM-602LU2P	USESJR5SK058
T600▲	TRANS POWER 7739	LTT2PC0KT030
TU601	TUNER UNIT UB110AF	UTUNATSSP005
X601	CERAMIC RESONATOR ZTT4.00MGW-LC	FY0405PLN004

© 2008 Funai Electric Co., Ltd.

All rights reserved. No part of this manual may be reproduced, copied, transmitted, disseminated, transcribed, downloaded or stored in any storage medium, in any form or for any purpose without the express prior written consent of Funai. Furthermore, any unauthorized commercial distribution of this manual or any revision hereto is strictly prohibited.

Information in this document is subject to change without notice. Funai reserves the right to change the content herein without the obligation to notify any person or organization of such changes.

FUNAI with the  design is a registered trademark of Funai Electric Co., Ltd and may not be used in any way without the express written consent of Funai. All other trademarks used herein remain the exclusive property of their respective owners. Nothing contained in this manual should be construed as granting, by implication or otherwise, any license or right to use any of the trademarks displayed herein. Misuse of any trademarks or any other content in this manual is strictly prohibited. Funai shall aggressively enforce its intellectual property rights to the fullest extent of the law.